Amendments to the Specification:

Please replace the ABSTRACT with the following amended ABSTRACT:

ABSTRACT

A transistor structure having an gallium arsenide (GaAs) semiconductor substrate; a ~~an indium aluminum gallium arsenide (InAlGaAs)~~ lattice match layer; an indium aluminum arsenide (InAlAs) barrier layer disposed over the lattice match layer; an $In_y Ga_{1-y}$ As lower channel layer disposed on the barrier layer, where y is the mole fraction of In content in the lower channel layer; an $In_x Ga_{1-x}$ As upper channel layer disposed on the lower channel layer, where x is the mole fraction of In content in the upper channel layer and where x is different from y; and an InAlAs Schottky layer on the $In_x Ga_{1-x}$ As upper channel layer. The lower channel layer has a bandgap greater that the bandgap of the upper channel layer. The lower channel layer has a bulk electron mobility lower than the bulk electron mobility of the upper channel layer where~~. X is in the range between 0.15 and 0.90 and y is in the range between 0.0 and 0.65. Preferably~~The transistor structure has most of the benefits of the InP split-channel HEMT but uses a GaAs substrate and has a phosphorus-free layer structure. The structure enables the use of indium contents outside the normal range allowed on InP substrates and allows a greater range of indium content relative to devices grown on InP substrates. The split-channel (i.e., upper and lower channel layers) allows independent optimization of the upper channel layer for excellent electron transport at the low electric field conditions found in the low electric field region, such as between gate and source, while performing an independent optimization on the lower channel layer material to obtain optimum electron transport in regions having a high electric field such as between the gate and drain. The device achieves an excellent compromise between these two opposing parameters (i.e., low impact ionization and high gain at high frequencies) while enjoying the low cost and manufacturability afforded by the use of GaAs substrates.